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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/621,125	07/16/2003	Manish Sharma	10017899-1	1954

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FORT COLLINS, CO 80527-2400

EXAMINER

TSAL, H JEY

ART UNIT	PAPER NUMBER
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2812

DATE MAILED: 11/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/621,125

Applicant(s)

SHARMA, MANISH

Examiner

H.Jey Tsai

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) 11-14 and 26-40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 15-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Election/Restriction

This application contains claims drawn to an invention nonelected. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 5-10, 15-25 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Nickel et al. 2002/0036331, previously applied.

Nickel discloses a method of developing growth of <111> crystal texture within at least one layer of composition of a magnetic memory cell, the method comprising applying the at least one layer (AF pinning layer or FM pinned layer, para. 36, 35) of composition within the memory cell with a level of ion energy that is sufficiently high to enable alignment of the at least one layer of composition to a high degree of quality for the <111> crystal texture across a layer 620 and/or 626 (an insulating tunneling barrier layer) which attenuate crystal texture, fig. 9 or fig. 10 (para. 39),

a tunneling barrier layer 620 in the memory cell prior to apply the at least one layer of composition (AF or FM),

wherein the magnetic memory cell is a tunneling magneto resistive junction,
para. 13,

wherein at least one of the layers of composition is a synthetic ferromagnet, para.
14,

wherein the synthetic ferromagnet comprises:

a first ferromagnetic material 18/16, a non-magnetic spacer layer 27 fabricated
on top of the first ferromagnetic material 18/16, and a second ferromagnetic material
22/24 fabricated on top of the non-magnetic spacer layer 27 and having a magnetic field
orientation opposite that of the first ferromagnetic material, para. 15-24 and fig. 1,,

wherein the synthetic ferromagnet comprises more than two ferromagnetic
materials, wherein the ferromagnetic materials are separated from one another by a
non-magnetic spacer layer 27, wherein each successive ferromagnetic material has a
magnetic field orientation opposite that of a previous ferromagnetic material, para. 15-24
and fig. 1,

wherein the first ferromagnetic material has a thickness and magnetic field
strength, which are equivalent to the second ferromagnetic material, para. 20-27,

wherein the first ferromagnetic material has a different thickness and magnetic
field strength than the second ferromagnetic material, para. 29,

seed layer is Ta, para. 19,

ferromagnetic sense layer 18, 24 is NiFeCo, para. 27,

tunnel barrier layer 720 is Al_2O_3 , para. 40,

antiferromagnetic pinning layer 716 is IrMn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2, 3 and 4 stand rejected under 35 U.S.C 103 as being unpatentable over Nickel et al. as applied to claims 1, 5-10 and 21-25 above, and further in view of Torng et al. 5,764,445 and Level of ordinary skilled person in the art, previously applied.

The difference between the references applied above and the instant claim(s) is: Nickel et al. teaches using a high ion energy level deposition to form a magnetic layer which has high degree of quality for the <111> crystal structure and a tunneling barrier layer for memory device but does not teach adjusting the deposition ion energy from lower level to higher level of ion energy (deposition power). However, Torng et al. teaches at col. 4, lines 39-54, col. 9, 10, lines 11-38, that enhancing the crystal orientation (texture) in <111> of a magnetic layer by depositing the magnetic layer in higher plasma power such as 1 KW and/or biased at 50V (increasing ion energy of RF sputter deposition) and measuring the crystal texture (orientation) with X-ray diffraction to check for the high level of quality (enhanced or preferred or predominant) crystal texture (orientation) of the deposited layer. And, adjusting ion energy from lower level to higher level and measuring the crystal texture quality (enhanced or preferred or predominant) in <111> crystal orientation as claimed are taken to be obvious since

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these are variables of art recognized importance which are subject to routine experimentation and optimization and discovery of an optimum value for a known process is obvious. In re Aller, 105 USPQ 233 (CCPA 1955). And, even if applicants' modification results in great improvement and utility over the prior art, it may still not be patentable if the modification was within the capabilities of one skilled in the art, In Re Sola 25 USPQ 433.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above references' teachings by adjusting the ion energy (deposition power) from low to high to obtain an optimum value of high level of quality (enhanced, preferred or predominant) of crystal texture (orientation) of a deposited layer such as magnetic composition material as taught by Torng et al. and an ordinary skilled person in the art because high level quality (enhanced, preferred or predominant) of crystal texture (orientation) of a deposited layer such as magnetic composition material would increase the magnetic field in the memory device which is a magnetoresistive device.

Conclusions

Applicant's arguments filed Sept. 9, 2005 have been fully considered but they are not persuasive. Because Nickel et al. clearly teaches at para. 35-36 (or 39) and fig. 9 (or fig. 10), at one layer of composition with the memory cell with a level of energy to a <111> crystal texture across a layer 620 and/or 626, an insulating tunneling barrier layer which attenuates crystal texture. And, Torng also clearly teaches at col. 8, lines 25-56

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and fig. 5, one layer of composition to a <111> crystal texture across a layer an under layer of insulating barrier layer which attenuates crystal texture.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry of a general nature or clerical matters or relating to the status of this application or proceeding should be directed to the customer service whose telephone number is (703) 308-4357.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to H. Jey Tsai whose telephone number is (571) 272-1684. The examiner can normally be reached on from 7:00 Am to 4:00 Pm., Monday thru Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael S. Lebentritt can be reached on (571) 272-1873.

The fax phone number for this Group is (703) 872-9306.

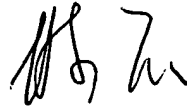
hjt

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A handwritten signature in black ink, appearing to read 'H. Jey Tsai', is positioned above the printed name.

H. Jey Tsai
Primary Examiner
Patent Examining Group 2800